

133 Coalcomán, which again reaches elevations of over 10,000 feet. The rain shadow of this range accounts for the subarid conditions of part of the basin area. Although these mountains are little known, apparently they rise fairly steeply on both faces and the coastal area beyond is narrow and of little use.

[132] The drainage of Michoacán presents some peculiarities. In the north and west central region are lakes of various size, of which perhaps the best known is Lake Pátzcuaro. In common with some other lakes in the area, Lake Pátzcuaro has no outlet, but its waters are nevertheless not brackish. The high porosity of the volcanic soil may account for this phenomenon, for the lake has evidently been isolated from other drainages for a long period of time. This isolation is attested by the fact that the native fish are all very primitive viviparous species.

[136] Moreover, despite heavy rainfall in some areas (at Lake Pátzcuaro the average annual rainfall is around 60 inches), there are virtually no permanent streams and even springs are rare. Most Tarascan towns suffer from almost constant water shortage despite the heavy precipitation. In contrast, some of the lower lands have abundant large running streams. In places, underground springs of great size emerge at elevations of about 5,500 feet. Near Uruapan, for example, a large stream is formed by a group of such springs.

[131] The present-day range of the Tarascans cannot be defined with great accuracy, partly because of the lack of detailed studies and partly because of the degree of acculturation undergone by many settlements. Villages which outwardly differ in no visible respect from well-known Tarascan settlements often contain no persons speaking Tarascan. All around the edges of Tarascan territory occur villages in various degrees of assimilation to Mexican culture and with various degrees of physical mixture with the Mestizo population. As a result, the present-day distribution of the Tarascans can only be approximated (map 1).

[10] On the east, the basin of Lake Pátzcuaro is definitely Tarascan, although some towns, such as Tzintzuntzan, the traditional capital of the Tarascan "Empire," are no longer Tarascan-speaking. The western edge of Tarascan ter-

[p. 56]

- 13) ritory is close to the railroad which runs through the town of Zamora to Los Reyes.
 10) The southern boundary might be defined roughly as on a line from Los Reyes to Uruapan and thence close to the railway from Uruapan to Pátzcuaro, while the new highway from Mexico City to Guadalajara in some places runs just inside the northern limits and in others, just outside. Within or near the borders of the present-day Tarascan area occur a number of old Mexican towns closely associated with the historic Tarascans and their contemporary culture, which provide the administrative centers and the major market places. These towns are Pátzcuaro, Zacapu, Purépero, Zamora, Los Reyes, and Uruapan. In some instances other towns of local importance have arisen more recently, towns which were once Tarascan but are now occupied by Mestizos and deculturated Tarascans. A good example of such a town is Chilchota.

- 13 Viewed as a whole, the Tarascan area may be characterized generally as an elevated temperate region of sufficient rainfall, deep volcanic soils, and pine or mixed pine and hardwood forests. In detail there are differences, and a number of regions may be identified.

- The easternmost region is that about Lake Pátzcuaro. The lake has an elevation of slightly over 7,000 feet, and most of the villages are either on the shore or upon islands in the lake. The forests have been cleared away around the lake except upon lands too steep to cultivate with the plow. Rainfall is heavy, but is concentrated in the summer months. The climate is temperate and cool even in mid-summer.

North of Lake Pátzcuaro is a large fertile valley or depression near Zacapu, ringed about by hills and mountains covered with forest. Although there is but little difference in elevation from Lake Pátzcuaro, the climate is warmer and some tropical or subtropical plants such as sugarcane are grown on a small scale.

Over a range of mountains to the west of Zacapu is a fertile valley known as La Cañada. Here the climate is warmer and more arid, as is evidenced by the frequency of irrigation and extensive cultivation of citrus fruit, bananas, and similar tropical and subtropical plants.

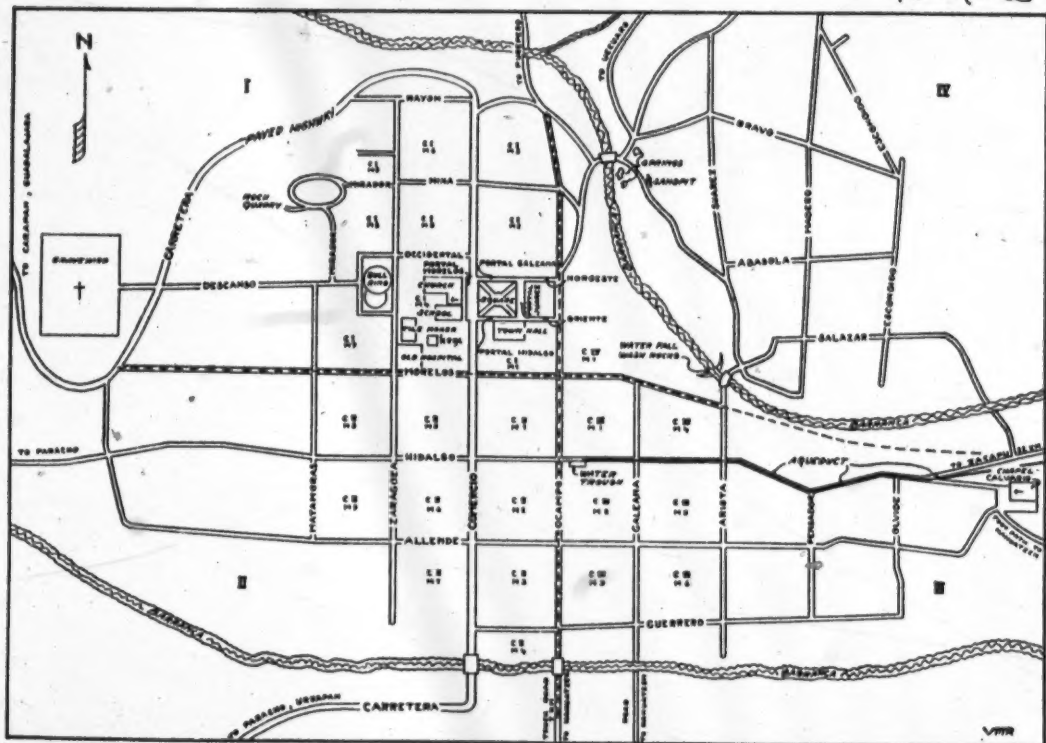
[912]
 [241] [text continues on p. 7a]

1: Reals E-5 (1940-1941) 1946

NU34 Tarasco NU34
Sierra Tarascans

CERDÁN: A SIERRA TARASCAN VILLAGE—REALS

368
312
621
362



MAP 5.—The town of Cerdán, showing street names and the barrio numbers. C, cuartel, or barrio; M, manzana, or block. Numbers indicate the town numbering system.

[p. 11]

[p.15a]

37 either from the sides of public roads or from fields, with the permission of the owner. It is dug with pick and shovel, put in bags, and taken into town on muleback.

[492]

333 Adobes (adóbl) and adobe mortar are made from any convenient fine earth mixed with manure. In some towns dry pine needles ("huinomo")* or wheat or barley straw is used. The mud (adimu) for adobes is mixed in a depression in the ground. Dry earth is first mixed with manure and water is added, in the proportion of 10 loads (*carretilladas*) of earth, half a sack of manure or straw, and 10 five-gallon tins of water. The mud is then mixed with a spade for about 3 hours.

A wooden frame (*marco* or *adobera*), the size of the brick to be made, is now placed on carefully leveled ground. Mud is placed in the frame and pressed down well with the hands to insure complete filling of the space. The frame is now lifted off and washed in preparation for making the next adobe. The adobes are allowed to dry for 8 days, first in the original position and then on edge.

The usual size of adobes is 60 by 40 by 10 cm., or $2\frac{1}{2}$ spans long. Cherán makes this size and also a brick 3 spans in length.

WATER SUPPLY

- 312 Cherán has a better water supply than most Tarascan towns, but it is still far from adequate. The larger of the barrancas through town often has flowing water, but this is used only for watering animals and washing clothes, as it is not considered pure enough to drink. At one spot, however, there are a number of small springs in the walls of the barranca. These have been improved by building cement tanks to accumulate the rather small flow, and people from the *barrio* of Paricutin and some other nearby residents obtain their water from the springs.

About 10 years ago an aqueduct was built to large springs near the base of the mountain, El Pilón, a distance of 15 km. (9 mi.). A 2-inch pipe line was laid, but the pipe reached only to the edge of town. From the end of the pipe the water is carried to the center of town by an arrangement of hand-hewn wooden

[104]

* Words regarded in Cherán as Spanish but which either do not appear in dictionaries or have special local meanings are placed in quotation marks.

[p. 15b]

312 troughs and pipes (pl. 3, upper left). Large tanks exist in the approximate center of town, and water is also piped to a fountain in the plaza. The troughs leak, however, and in some places are low enough to permit water to be dipped directly from them. In consequence, if the flow is small, water may not reach the tanks in sufficient quantity. The lower portion of the town receives no water directly and the effort of obtaining water in those sections, particularly the southwest district, is considerable.

FOREST UTILIZATION

313 The forests are one of the important and most utilized natural resources of Cherán. Firewood, charcoal, posts, railroad ties, shakes, and lumber of various sizes are secured from the woods. Forests cover a very large part of the Cherán lands and most of the timber is on public domain, although some forest patches may occur on privately owned land. The public domain is regarded as belonging to the town, and the Federal Government levies a nominal land tax on the community for the forest lands. [651] Each head of a household pays a fee (*rustica*), usually 25 centavos a quarter, which is collected by a committee on community property (*bienes comunales*). This sum covers the taxes and gives each person the right to cut firewood from public lands. Persons exploiting other forest resources pay more.

656 Until recently utilization of other forest resources was also open to everyone. The Department of Forestry of the Federal Government is now attempting to control the exploitation of the forests, and since 1940 any use of the forest for purposes other than cutting firewood requires a permit. In 1941 an effort was being made to restrict all lumbering and charcoal burning to members of a cooperative. This is discussed later.

[556] With the exception of a few wealthy persons, everyone who is not lazy cuts his own firewood.*

[438] * This is general even in such Mexicanized towns as Chilichota. In the latter town, however, there is some selling of firewood. During planting and harvest times the price is \$0.25 a *carpa* (burro load in this case); the rest of the year it is \$0.25 a *carpa*. Some people in Angahuan make a business of taking firewood to Matine Zamora; similar cases occur in villages near Matine towns. Coets (pitch pine), used principally for light, is also produced by the householders in Cherán. A long vertical cut is made on one side of a tree, which is gradually cut away as pitch accumulates. The tree is rarely cut through, but it usually dies from the operation. In Chilichota, where coets (pitch pine) is sold, [435] [563]

[text continues on p. 17a]

333 scaffolding, and string to line up the walls. Perhaps a dozen men do masonry, mostly as a secondary occupation. Work is usually charged for on the basis of square meters of wall.

305 *Barbers.*—Most men in Cherán now have their hair cut by a barber. There are two barbers in town regularly, and more come to town during fiestas. The Cherán barbers also visit nearby towns during fiestas. During the middle of the week they have little trade.

Formerly men cut each other's hair for nothing in the bull ring on Sundays, using only scissors. The barbers have clippers as well and also razors for shaving, although there is not much demand for the latter. One barber is not a native; the other learned the trade in the United States.

312 *Water carriers.*—In most households the women bring the water from the fountain or
482 aqueduct in ollas carried on their shoulders.
462 However, for any commercial use (*nixtamal* mill, masonry, the threshing machine) water is carried by men. In addition, there is one man who makes his living carrying water for storekeepers, whose wives may be too busy helping in the store, and for a few families who are somewhat Mestizoized and the husband has decided the work is too hard for the women.

Interestingly enough, the men's method of water carrying is entirely different from that of the women. Men carry water in two 5-gallon cans suspended from the two ends of a pole which is supported on the shoulder. This rigid dichotomy is observed even in families where one of the men or boys brings the bulk of the water. If the women need to bring additional water, they always use ollas and make several trips.

FOOD PROCESSING AND DIET

128 Consideration of food processing in this section is confined primarily to household activities. Commercial processing of food for sale, such as baking, butchering, and ice cream making, will be considered later.

251 The storage of food is confined primarily to maize, wheat, beans, and broadbeans (*habas*). Except for small supplies for immediate use, stores are kept in the house, usually in the loft. Maize is stored on the cob. Wheat, beans, and similar seeds are stored in gunny sacks or in

[9.746]

Sierra Tarascans

253	15 arrobas (375 pounds).....	\$90
433	14 arrobas (350 pounds).....	65
434	16 arrobas (400 pounds).....	92
	Retail price (per kilo).....	.70
	Gross profit on beef (per kilo).....	.40-.45
	Price of pigs.....	30.00 and up
	Gross profit, per week.....	7.00-8.00
	Gross profit, per pig.....	3.50-8.00

Comment: Returns to butchers are slight on the basis of meat sales. Generally the profit consists of: (a) Meat for the family at no cost, and (b) sale of the hide, usually for \$10.00. Most butchers handle beef only, but one who specializes on pork, butchering one or two a week, claimed a profit of 7 or 8 pesos. An item unaccounted for in the figures for beef is a tax of \$5.00 on each animal killed. It is also widely believed that some butchers deal in stolen cattle at a considerable profit. Few butchers lack other sources of income, however, which argues against great profits. Butchering also varies in profitability at various seasons; when cheese is abundant the demand for meat falls off, and the butcher may have to dry part of his meat and sell it at a lower price.

Field watchers:

241
434

Wages:

In maize	1 row in 30
Average income for 6 weeks to 2 months (cash value of maize).....	\$60-\$65

Comment: Field watchers (*veladores*) must be men of good reputation. Usually they watch 20 to 25 pieces of land. Although wages seem high—\$1 a day or more—the work is seasonal and involves staying day and night in the fields.

Water carrying:

312
434

Charge for two 25-liter cans.....	\$0.06
-----------------------------------	--------

Comment: Only one man engages in this work regularly. He works fairly steadily, but no data were secured on his income. Presumably it is as good or better than he could earn as a laborer.

Beekeeping:

231
433
434

12 hives produced:	
15 liters of honey at \$0.60.....	\$ 9.00
3-4 kilos of wax at \$2.25-\$2.50.....	6.70-10.00

Wax:

1 kilo makes 10-centavo candles worth.....	3.00- 3.25
3-4 kilos make 10-centavo candles worth.....	9.00-13.00
Potential income from 12 hives if owner makes candles.....	18.00-22.00

Comment: In all cases bees are kept as a profitable, but not extremely important, sideline to other activities.

389
433
434

Fireworks making:

Figures from the one fireworks maker in Cherán proved inconsistent upon analysis. The following facts seem reasonable.

632 forest fire damaged a considerable area and the forestry engineers called the representative down severely for not having been more efficient in fighting the fire. This attitude was hardly justified in view of the strong Tarascan tradition of burning the pastures in the winter. Illegal exploitation of the forests is also blamed on the representative. Two major cases occurred during the period field work was under way, one involving illegal cutting of railroad ties, the other, illegal sale of lumber. Responsibility for failure to prevent both infractions was laid to the laxness of the *representante*. In connection with one of these cases, a town *junta* was called to discuss what should be done, but no decision was reached and the matter was finally dropped.

632 It was evidently felt that the *representante*
578 would be involved in boundary disputes if they affected public lands. The two disputes existing in 1940, however, apparently affected only lands in private ownership. The dispute with Arantepacua was in process of settlement with a compromise being made between the two claims. As there was only a question of which town would get credit for the taxes paid, the dispute was not bitter. The quarrel with the former *tenencia* of Cheranástico, however, was much more prolonged and bitter. Apparently Cheranástico claimed some of the best agricultural lands of the lower plain as community property. It was, however, owned in individual holdings by owners who all had registered titles. Consequently, Cheranástico has accomplished nothing, but every time there was a new governor or other governmental change, the people of Cheranástico made another attempt.

BARRIO FUNCTIONS AND COMMUNAL IMPROVEMENTS

632 In addition to the function of the *barrio* or
621 *cuartel* as an administrative device as described above, certain public improvements are made through the *barrio* mechanism. In this the *barrios* do not act independently but merely as instrumentalities of the *municipio*. No informant had ever heard of a *barrio* doing anything on its own initiative.

632 The major duty performed by the *barrio* is
621 the maintenance of the water system. Each
312 *barrio* has a section of the aqueduct within the

632 town (not the pipe line to the edge of town but
 621 the system of hollowed logs which conducts
 312 water to the center of town) for which
 it is responsible. Upon notification that re-
 pairs are needed or that logs must be
 replaced, the *barrio* chief notifies men in his
barrio of the work needed and the time.
 This notification may come from the *sindico*
 (or his *veedor*), or any person noticing some-
 thing wrong may report it to the *municipio*.
 The *barrio* not only provides labor but must
 raise funds if equipment or materials are
 needed. *Barrio* I is responsible for the section
 from the cement water tanks to the street called
 Arista. *Barrio* II is responsible for the section
 from Arista to Pensador, *barrio* III for the
 section from Pensador to Olvide, and *barrio* IV
 for the section from Olvide to the pipe line.

The work is done under the direction of the
sindico. Usually 24 *comisionados* are named
 for each log trough needed. Eight men are
 responsible for cutting the log and hollowing it
 out; 8 more bring the log down from the moun-
 tains, and 8 others put it in place.

632 In addition, each *barrio* has responsibility for
 621 certain other public works. For example,
 [491] *barrio* III is responsible for maintaining two
 bridges on the road to Zacapu.

[767] Still another *barrio* duty is cleaning the
 graveyard of weeds and brush in preparation
 for the Day of the Dead. The cemetery is
 divided into four squares corresponding to the
 four *barrios*, and the young men from each
barrio are assigned to a section. In 1940, in
barrio III, having the most numerous popula-
 tion, each youth had a strip 4 paces wide by 65
 paces long to clear, while youths of other
barrios had strips from 6 to 8 paces wide.
Barrio IV, although having a population as
 large as *barrio* II and larger than *barrio* I, took
 a half day longer to do its part and the young
 men were teased about it.

632 The maintenance of the pipe line is a sore
 621 point, evidently. The original pipe line was
 312 installed by the State or Federal Government.
 653 Some maintenance is done by the *municipio*,
 but the line was in bad condition in 1940 and
 needed replacing. Even more interest, how-
 ever, was shown in replacing the present wooden
 aqueduct with a pipe line and perhaps extend-
 ing it to some other parts of town. It was

632 estimated that the project of merely replacing
 621 the wooden aqueduct would cost between \$2,500
 and \$3,000, and efforts were being made to get
 ● 312 the Federal Government to provide the money.
 653 Actually the job could have been done by an
 assessment little larger than that called for by
 the two main fiestas of the town, but such an
 idea had not occurred to anyone. This feeling
 that major improvements should be made by
 outside agencies is a common one in Mexico.

377 This attitude was somewhat reinforced by
 the action of the Federal Government in ex-
 632 tending a power line to the town and supplying
 653 it with street lighting. In this case, it is true,
 621 the town was required to provide the posts for
 the power system. *Comisionados* were named
 who cut the posts and charred the ends under
 the direction of the *sindico*. However, this
 involved expenditure of labor rather than of
 money.

491 A number of road repair jobs are undertaken
 from time to time. In 1940, in preparation for
 632 the harvest, the community repaired part of the
 621 road toward Nahuatzen. A new entry into
 town was made which avoided the necessity of
 crossing a bridge over the southern *barranca*.
 The existing bridge was in bad repair, and
 replacement was thus postponed.

ELECTIONS

632 Elections in Cherán ostensibly follow regular
 legal forms. Extensive and nearly complete
 666 lists of voters are prepared by the municipal
 662 officials. Some 2 or 3 weeks before the election
 the mayor calls a town meeting to nominate
 candidates. The mayor asserted that everyone
 was invited in 1940 but that very few attended.
 Most of those, he insisted, had been rounded
 up by the police. Others felt that only the most
 influential people in town were invited. In
 either case, apparently only about 50 persons
 attended. As at the 1940 election *barrios* II
 and IV were to elect members of the *ayunta-*
miento, two tickets were nominated. These
 tickets were forwarded to the State offices of
 the PRM (*Partido Revolucionario Mexicano*)
 in Morelia, and the second of the two tickets
 was approved as the official PRM ticket. This
 must have been an act of prestidigitation on the
 part of the State officials, for there was nothing
 to choose between the two tickets and the State

796 The duties of the kámbiti are to pay the ex-
 794 penses of the Holy Week festivities and to deco-
 rate the front of the main altar with fruits from
 the hot country, such as bananas, watermelons,
 mameys, coconuts, mangoes, and sugarcane.
 The fruits are suspended in small nets or are
 perforated and hung from strings. The cere-
 mony is called uirimutakua, which means "to
 adorn the front of something."

On Holy Saturday the young people of the
 town divide in two groups and go through the
 town, the girls carrying an image of Mary
 Magdalene, the men one of Saint Joseph.
 At strategic points the two groups meet and
 have races with the images. Certain young
 girls also place themselves at the door of the
 church during Holy Week and offer the re-
 freshments known as *çarápes* to all comers.
 These girls must change the flowers on the
 altars during the ensuing year and are known
 as *cacaki jaírati*. All these ceremonies are
 regulated by the kámbiti.

● [312] The petájpe gathers the young men at his
 house in February and feeds them "*esquite*,"
 of the type known as *kanita takunji*. At this
 time he announces the date for cleaning the
 spring from which the town gets its water.
 The day the spring is cleaned, the petájpe pro-
 vides music and rice, beans, and pork for the
 helpers at his house. At the spring, many
 families go along and take picnic food, singing
 and enjoying themselves while the young men
 clean the spring. When the spring is cleaned,
 they carry *ollas* of water to their houses, using
 it as drinking water in preference to water
 from the pipes until it is gone.

There are no data on the office of *biskál*.
 Rendón's notes suggest that the offices of
 petájpe and *biskál* are the same.

To reach the office of *mayor*, one must give a
 fiesta to the patron saint and appear as a moro
 dancer. The moros dance on December 25 and
 26 in the houses of the elders. On the 24th
 they worship in the church. *Mayores* must aid
 their superiors with firewood and their wives
 grind and carry water when the *alcalde* or
 kámbiti or petájpe hold a fiesta.

The *kiépi* has similar duties to the *képi* of
 Cherán. He is entrusted with the care of the
 church and follows the orders of the *alcalde*
 in cleaning and adorning the structure. He

[p. 197b]

517

Octava, 4 days
Corpus, 4 days
Nahuatzen fiesta, 1 day (got drunk)
San Juan, 1 day
San Pedro, 1 day (wife's father had a little
fiesta; got drunk)
Nahuatzen fiesta, 1 day
San Francisco fiesta, Cherán, 4 days
Wedding, 1 day
Wedding, 1 day
Negrito dancers, watched 1 day
Wedding, 1 day
Funerals, remembers two, but not certain.

Aside from the funerals, this informant remembers spending over 24 days in entertainment during the year. Agustín, on the other hand, spent 41 days (aside from the time after he first arrived in town), at least 6 days being spent at weddings and 8 days in dancing. From various information collected, it seems reasonable to believe that most men spend at least 20 days in weddings, fiestas, and similar entertainment, while young men probably exceed this figure.

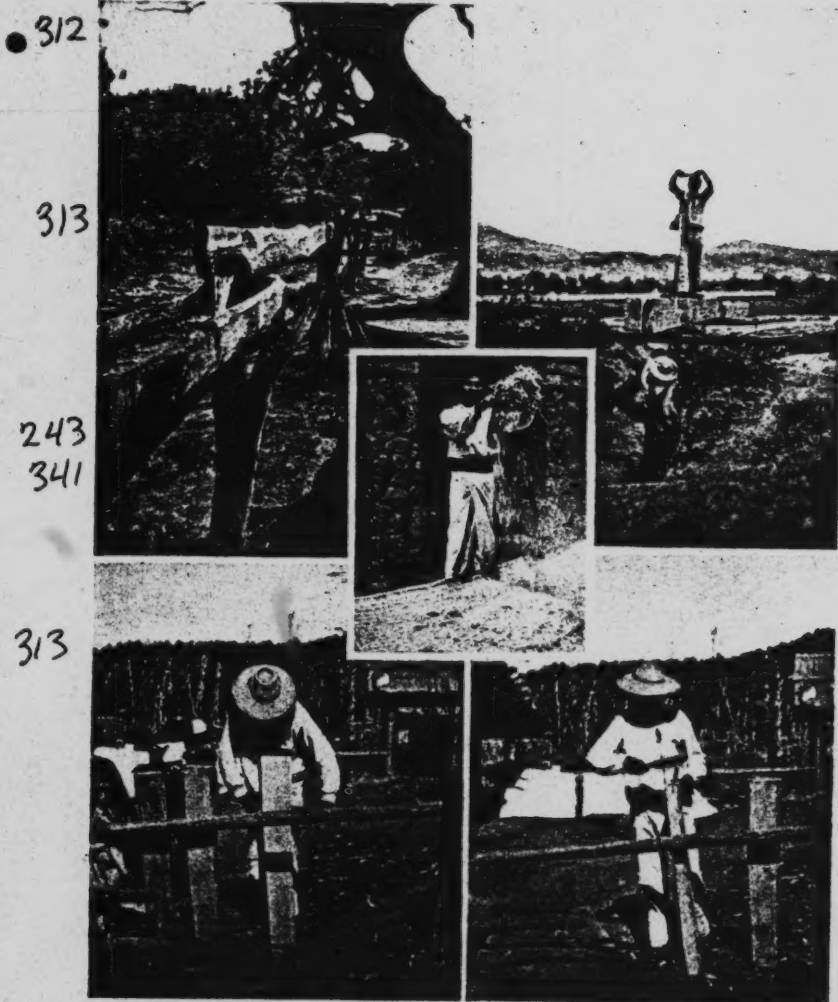
462
312

Women, in general, work longer hours at more varied tasks and with numerous interruptions. While women also attend fiestas and weddings in Cherán, they are less apt to go elsewhere. Moreover, even on fiesta days there are meals to prepare and water to carry. Women's work, however, is essentially more social. Water carrying is almost a ritual, as is going to the mill with the maize. Water is almost always carried in special decorated and polished ollas used for no other purpose. Water is dipped out of the fountain in the plaza, the tank at the end of the pipe line, or out of the hollow logs of the aqueduct. The ollas are always carried on the left shoulder on top of the rebozo, which forms a sort of pad. Women often go in groups after water and the task is frequently an occasion for meeting friends and talking. Taking maize to the mill is less formalized behavior, but it, too, is a social occasion, which may take 15 minutes and may take an hour, depending on the time of day and the number of friends encountered. Most women prefer to go at a rush hour when they have to stand in line, because they meet so many friends.

[482]

461
462

The best picture of women's activities may be presented by giving a number of actual



CHERÁN AQUEDUCTS, BOARD SAWING, SHAKESPLITTING, AND WHEAT WINNOWING.

Upper (left): The Cherán aqueducts, east of town. *Upper (right):* Sawing planks with sawpit. Often, the timber is raised on a pole framework instead of being placed over a pit. *Lower (left):* Splitting off a shake with a rasedor. *Lower (right):* Starting to split a shake with a machete struck with a wooden mallet. *Center:* Cherán man winnowing wheat.

[End Plate 3]

342 where Mestizo influence is marked. Nevertheless, in some towns, such as Capacuaro, almost the only nonwooden structure is the church. Structures of wood also occur in the other districts, although they are relatively rare.

The difference in materials used apparently has a geographic basis. The Sierra region has abundant forests, while often lacking sufficient water to permit easy manufacture of adobes or

[continued on p. 7b]

The Town of Cherán THE TOWN

361 The town of Cherán lies at the head of a broad valley about 1,300 feet (400 m.) above the valley floor at an elevation of 8,500 feet (2,500 m.) (pl. 1, lower). The terrain slopes rather steeply toward the west. A small ravine forms the western half of the south boundary of the town; the eastern half of the south boundary lies beyond the ravine.

A much larger ravine forms the north boundary of the town. A branch of this ravine runs through the town and partly isolates the northeast *barrio*, or *cuartel*. Springs at the bottom of this ravine

[312] afford part of the water supply. A pipe-and-wooden-trough system also brings water from a spring 9½ miles (15 km.) away to cement tanks in the approximate center of the town as well as to a fountain in the plaza, which lies north of the center.

[135] At the northeast is a small cinder cone, which affords most of the stone used for buildings and fences. The town encroaches on the slopes of the cone on the east and south. The northeast *barrio*, or *cuartel*, climbs part way up the slopes of another cinder cone.

363 Most of the streets of the town are oriented to the cardinal directions, and the central part of town is subdivided into rectangular blocks. In some sections irregularities of the terrain have led to modifications of the block plan; in these sections streets may follow the curving contours. Streets vary in width from mere pathways to about 40 feet (12.2 m.). In the heart of town they are often paved with small cobblestones and have a central drain or gutter. Stone-paved sidewalks are common in the middle of town. The main north-south street is traversed by the Carapan-Uruapan highway and was paved with oil macadam in 1940.

[p. 7a] (continued bottom of page 7b)

[P. 3a]

- 133 historical examples of vulcanism within or adjacent to the area. However, vulcanism associated with human ancient settlement in the area, is unquestionably evidenced by the occurrence of charred maize ears embedded in a basaltic lava flow 18 km. northwest of Morelia.*

[172] Aside from land forms resulting directly from vulcanism, others caused by depositional processes occur within the Sierra. Between the old composite volcanoes and young cinder cones flattish surfaces have been formed first by ash and cinder fall and later by aeolian and alluvial deposition from surrounding slopes. Such surfaces, which compose only a small percentage of total land area, are the agriculturally important sections of the Sierra. Some form saddles or cols between adjacent hills; the larger plains form basins of interior drainage. The largest basins are Llano Grande, southeast of Charapan; the Plan de Nurio; that of Paracho, Aranza, and Cherán; the plain of Nahuatzen; of Sevina; of Paracho; etc. (map 2; pl. 1). Minor forms include dissected aprons of alluvium and semiconsolidated ash at the base of volcanoes and steep-sided arroyos eroded into alluvium in the upper parts of the basin plains.

One of the most characteristic physical features of the Sierra is the paucity of perennial streams and lakes. Although this is an area of moderate summer precipitation, the porous volcanic surface quickly absorbs most of the available moisture. A few permanent, spring-fed streams occur on the northern and western flanks of Cerro de Patamban and on the western and southern sides of Cerro de Tancitaro. Small springs occur on the flanks of the old composite volcanoes, whose porous rocks form a reservoir of rain water. Such springs afford the sole water supply for many Sierra villages. Only on the edges of the Sierra plateau, at the contact of porous and impervious rock layers, do large springs occur.

● [172] The Lake area.—At the eastern edge of the Sierra exists a depression filled by Lake Pátzcuaro. Sierran geomorphology (young and old volcanic forms) almost surrounds the lake, but predominates on its northern, western, and southern shores. Twelve kilometers south of Pátzcuaro small Lake Zirahuén, within the eastern prong of the Sierra, appears to have been formed by a lava-blocked

* An excellent specimen of charred maize as embedded is in the Museo Regional Michoacano, Morelia.

[P. 46]

133 higher hills and mountains rise 2,600 to 4,000 feet above the surrounding plains.

The young volcanic land forms found in the Sierra are lacking in much of the northern area, where the principal elevations consist of eroded composite Tertiary volcanoes. A few tongues of Recent lava flow from the Sierra into the northern edge of the plains, and cinder cones extend northward from El Zirate. Many lakes, some occupying structural basins, dot the northern area. The extensive sections of old alluvium, which form a good part of the plains, probably represent beds of Pleistocene lakes. At the northern and northwestern base of the Sierra many spring-fed lakes and marshes existed in historical times, e. g., Ciénaga de Zacapu, de Tangandacuaro, de Chapala, etc. The lacustrine basins and the borders of the former lakes and marshes were the major areas of Spanish settlement in the Tarascan North, for both afforded year-round pasture and sites for irrigated wheat farms. Some marshy sections still exist, but natural desiccation and artificial drainage have converted much of the wet area to dry farmland. The once extensive chain of lakes in the Cotija graben, west of the Sierra, has almost completely disappeared, and the marshes of Zacapu, around which are grouped a few remnant Tarascan pueblos, have been converted into a large farming area.

[311] A unique physiographic subarea of the northern zone, called "La Cañada," a narrow east-west depression at the northern base of the Sierra, is still one of the significant Tarascan regions. The valley floor, 10 km. long and 2 km. wide, decreases rapidly in altitude from 6,360 feet at its eastern end to 5,840 feet at Chilchota, near the western extremity (pl. 1). The western end of the valley is marked by an ancient lava flow, which once partially blocked normal drainage. Subsequent deposition of alluvium (possibly lacustrine) behind the lava dam has resulted in the present wide flattish floor of the valley's western half. Today the stream draining the valley flows subsequently through a deep gorge cut through the northern end of the lava flow. The numerous intermittent streams which descend from the adjacent hills have built up small alluvial fans along the valley sides. Like other areas at the edge of the Sierra, La Cañada is favored by numerous large springs issuing from fissures at the southern and eastern borders of the depression. Alluvium and water

[312]

[361]

[P. 5a]

- [133] have attracted human settlement to the valley
- [312] since prehistoric times. Sierra Tarascana, who
- [361] call La Cañada "Erätsamen" (view from above),
- [102] probably visited the valley for chile and early maize before the Spanish Conquest. Spaniards immediately seized the well-watered plains near Chilchota for wheat fields. Today La Cañada is a garden spot of orchards and wheat fields amid rocky volcanic hills.

CLIMATE AND VEGETATION

- 132 Meteorological data.—In dealing with meteorology, northwestern Michoacán will be treated as a whole; attempts will be made to point out regional differences in temperature and rainfall. Meteorological stations in the area are few; data are entirely lacking for the Sierra. Consequently, only general statements can be made concerning the weather and climate of modern Tarasca.

361 micho, occupy benches on hill slopes. With the exception of Paracho, Sierra settlements avoid the centers of basin flats. Likely; many villages were moved from pre-Conquest mountain sites to present locations near abundant plow land. The inhabitants of Urapicho, for example, tell a legend concerning the former location of their pueblo on the high slopes of the Cerro de Urapicho nearby. Formerly many of the La Cañada pueblos occupied protective slope and hill sites in the surrounding mountains, but after the end of the 16th century they were concentrated in their present locations in the alluvial floor of the valley (map 14).

● 312
[36] Settlement and water supply.—One of the most significant factors in the location of Tarascan settlements has been water supply. Aside from the Lake pueblos, almost every town in Tarasca is located near a spring. While the northern plateau and southern escarpment areas abound in springs, the Sierra has ever been a problem area in terms of water supply. In pre-Conquest
[TEXT CONTINUES TOP OF P. 26] —Amlyp]

312 times many towns supplemented the scanty flow from the local spring by constructing aqueducts (*dekákua*, *canoes*) of hollowed half-logs to bring in water from large springs some distance away. Furthermore, wooden reservoirs caulked with pine pitch were constructed at springs to conserve water during the dry season (Mus. Nac., leg. 102, Rel. de Chilchota, f. 10v.; Ponce Relación, vol. 2, p. 6). Wooden aqueducts are still employed in many Sierra pueblos to conduct water from springs to the village outskirts (pl. 2).

The progressive exhaustion of springs constitutes one of the most urgent welfare problems in the Sierra today. Scarcity of water in that area, however, is no modern difficulty, for during the 18th century many pueblos were sorely pressed in the dry season (AGN Historia, vol. 73, ff. 212-226).

[313] The present scarcity has been aggravated by continuous destruction of the forest. Some towns have partially solved the local water problem by digging wells in the adjacent basin flats. Nurio and Urapicho, whose springs have long been dry, obtain water from a common group of wells in a large basin nearby. Located within a basin, Paracho has always obtained water from wells. Moreover, the peculiar geological structure of Charapan's bench site has permitted the development of water-bearing strata beneath the town. These strata are now tapped by private wells dug in the house lots and public wells in various parts of town (pl. 2). Even the water level in wells is continually diminishing. During the dry season water must be carefully rationed to the inhabitants and their livestock. Other pueblos, which are located far from water-bearing strata in the basins and have springs that cease to flow in the dry season, suffer even more. The women of Azajo travel with burros 8 km. to San Jerónimo on Lake Pátzcuaro to fill their *ácatres*, and those of Ocumicho walk 3 km. and many from Patamban go 8 km. to the large spring at San José for water. Few towns have received Federal or State aid for the improvement of the local water supply; on their own initiative the people of some pueblos (e. g. San Felipe) have constructed concrete reservoirs to store spring water and have installed pipe to carry water to various points in the village. The majority of the towns, however, lack sufficient resources to improve their plight and continue to suffer through the dry season.

244 Tarascans plant few other minor native cultigens in the field. Camote or the sweetpotato (*Ipomoea batatas*) and jicama (*Pachyrrhizus erosus*) are planted in small amounts in La Cañada, but commercial production is found in the warm lands around Zamora, Lake Chapala, and the southern escarpment, outside the Tarascan area. Native vegetables such as chile and tomatoes are discussed under horticulture.

177 Introduced New World crops.—In Tarascan field agriculture these consist of two tubers: the 244 South American potato (*Solanum tuberosum*) and, as mentioned earlier, an *Oxalis* (*papa de Castilla*).⁸¹ Neither has much place in Tarascan food habits. The potato is now grown in some lowlands bordering the Sierra, e. g. in Comanja, where it is planted with maize. Its cultivation is slowly penetrating the Sierra, though most of the highland pueblos still reject it. Beals (1946, p. 26) states that Cherán residents began to grow potatoes around 1938.

243 Old World crops in Tarascan field agriculture.—
177 Among the crops which the Spaniards introduced into Tarascan culture the small grains, wheat and barley, were the more significant in terms of both food value and degree of adaptation. Wheat was probably first sown in the Lake area by Spanish missionaries during the 1530's; the Spanish ranchers and *encomenderos*, however, for whom white bread was the main item of diet, were the principal carriers of wheat culture among the natives. By the mid-16th century Spanish wheat fields had been established in many parts of the northern plateau, and Tarascans of various pueblos in that area were cultivating the grain in special fields in order to meet tribute demands of the Crown and *encomenderos*.⁸² Arabic irrigation techniques appear to have been introduced jointly with wheat culture, for both early Spanish and Indian wheat fields in the northern Tarascan area were artificially watered.⁸³ The Relaciones Geo-

[312]

⁸¹ The name "*papa de Castilla*" might indicate that the *Oxalis* species has been cultivated in Mexico for some time. According to local informants, however, it has been known in the area south and west of Lake Patzcuaro for only 30 or 40 years. The tuber is often seen in the Patzcuaro market. In Pichitaro it is boiled and eaten with piloncillo.

⁸² The *Suma de Visitas*, ca. 1540 (Pase y Troncoso, 1905, vol. 1) mentions that wheat was cultivated in the following indigenous pueblos of Michoacán: Acámbaro, Chocándiro, Chiquimilto, Chilchota, Guanaxo (Santa María Arriba), Taymeo, Indaparapeo, Zacaipa. Indians, however, were slow to adopt wheat foods. During the last quarter of the 16th century the Indians of La Cañada ate wheat only in times of maize famine (*Mun. Nac. leg. 102, Rel. de Chilchota*, 1579).

⁸³ Spaniards had introduced a Mediterranean grain adapted to winter rains and dry summers into a land of dry winters and wet summers. Con-

243 gráficas of 1579-81 (Mus. Nac., leg. 102) indicate
 (177) that by the end of the 16th century wheat cultivation was well established in the Tarascan area around the margins of the Sierra, i. e., in those areas first settled by Spanish ranchers.⁸⁴ Wheat penetrated slowly into the conservative Sierra. The *Relación of Tingüindín* (1581) states that in the Sierra villages the Indians had not taken to wheat cultivation. Even by 1789 some of the Sierra pueblos did not grow wheat, but by 1820 the grain was at last being cultivated in all the towns, Urapicho, Cocucho, Pamatácuaro, and Cheranátzicurin being among the last to adopt it (AAM, siglo XIX, leg. 707, *Memoria estadística*, 1841).⁸⁵

243 Today in most Sierra pueblos wheat is considered second only to maize in terms of acreage. Some towns raise the grain chiefly as a cash crop; others consume a large portion of the harvest. The Lake area and La Cañada, however, are the principal Tarascan wheat districts. In both, wheat acreage exceeds that of maize.⁸⁶ Although wheat foods are eaten in all Tarascan towns, in none do they replace maize as the chief item of diet. Throughout the present indigenous area [m]wheat foods play a significant part in religious festivals, apparently an adoption of European customs through Church influence.

A soft wheat called "colorado," probably a descendant of the Spanish grain introduced 400 years ago, is the principal type sown by Tarascan farmers. Both bearded and beardless varieties occur. This wheat is the "*trigo de temporal*" or "*trigo aventurado*," planted in October and harvested from April to June, depending on eleva-

● [312] sequently, to insure good yields, they resorted at once to irrigation. Later, experiments probably showed that a poor to fair yield could be obtained without irrigation in central Mexico, where occasional light winter rains occur.

⁸⁴ The wheat-growing areas mentioned: all of the northern plateau region, including La Cañada; Tarasato (*trigo de temporal*); Tingüindín; and Peribán. The *Pemex Relación* (observations made in 1888) mentions wheat at various Lake towns: Tzinizuntan, San Jerónimo, Erongaricaro, and Tancupato (Cocupo or present Quiroga).

⁸⁵ The Calderón report of 1789 (AGN Historia, vol. 75) mentions wheat only in a few Tarascan pueblos. It specifies, however, that only two pueblos (Ocuimicho and Pamatácuaro) of the Sierra grew maize exclusively. The report may have neglected to indicate many pueblos in which small amounts of wheat might have been cultivated.

⁸⁶ According to data from Secretaría de Agricultura records (1946), wheat acreage equaled that of maize in the municipio of Pátzcuaro; in those of Erongaricaro and Quiroga the acreage of wheat was more than twice that of maize; in Tzinizuntan, however, maize acreage exceeded that of wheat by eight times. In the municipio of Chilichota (which includes La Cañada) approximately 800 hectares were planted to maize, while 513 were in wheat. Considering the valley of La Cañada alone, wheat acreage probably would exceed that of maize.

[P. 44 a]

243 tion.⁸⁷ Owing to dry conditions and usually poor
 [132] soils, yields are low. The infrequent light winter
 rains (*cabañuelas*) often determine the success or
 failure of the temporal crop. Another wheat
 type, a white soft variety, is called "*trigo de
 aguas*"; sown in June or July and reaped in
 November or December, it is seen in all parts
 of Tarasca. Most of the wheat crop of La Cañada
 is irrigated, being sown on the valley flats in
 December and harvested in May.⁸⁸ In the Sierra
 wheat is relegated to the less fertile slope land and
desmontes, where it is rotated with maize. In the
 lake area and the northern plateau towns, where
 the grain is likewise a rotation crop, it is cultivated
 on both plains and slopes. It is occasionally sown
 in the house-lot gardens in all parts of Tarasca.

Primitive European methods are used in wheat
 cultivation (pl. 6). Land is prepared by plowing
 with oxen, and seed is sown broadcast and covered
 with a brush harrow. Grain is cut with the
 sickle (*hoz*), bundled and tied by hand, and
 threshed in the *era* (an open arena floored with
 stone or packed earth) located in the town or in
 the field. Threshing is accomplished by driving
 mules or burros over the bundles of wheat, but
 where sufficient animals are lacking, it is done by
 flailing. The grain is separated from straw and
 chaff with the *tarákua*, or wooden spade. All
 straw is carefully saved for animal feed. (Engine-
 powered separators are just beginning to appear
 in the area.)

252 One of the most interesting aspects of wheat
 culture among the Tarascans is the varieties of
 262 food prepared from both metate-ground and
 milled flour. Those made from grain wet-ground
 on the metate include *tortillas de trigo*, a common
 food in La Cañada, but eaten on fiesta days (e. g.
 Corpus) in the Sierra towns.⁸⁹ In Charapan the
 tortillas are thin, round cakes often 1 to 1½ feet in
 diameter, which are cooked on the comal. Thicker
 tortillas, or *gordas*, are similarly made, but
 browned on the coals.⁹⁰ For the Corpus fiestas
gordas (*pirféis*) ¾ to 1 inch thick and shaped like

⁸⁷ For example, most temporal wheat in the Lake region is harvested in early April, while in the Sierra ripening is retarded until May. In Cumachin, the highest pueblo in the Sierra, harvest occurs in the first weeks of June.

⁸⁸ The *trigueros*, or wheatfields, are watered three times annually, at the end of January, first of March, and at the end of March. Fan irrigation technique is used.

⁸⁹ In the Lake towns of Iznatzio and Janitzio metate-ground wheat dough is mixed with nixtamal (maize dough) to make a tortilla called *itakana*.

⁹⁰ Beale (1964, p. 82) mentions that in Chertón *gordas de trigo* are fried in deep pork fat. This procedure was not encountered in other Tarascan towns.

[P. 47-a] Sierra
Pátzcuaro

262 raw (when aged or *pasado*) or, more recently, cooked on Easter, and sometimes on the village saint's day are distributed to all inhabitants at the end of the fiesta.¹⁰¹ Moreover, cacao beans were formerly an important trade article imported into the upland pueblos. In most households in the Sierra the beans were roasted on the *comal* and then wet-ground on the metate. Mixed with piloncillo and cinnamon, the chocolate "dough" was made into small disks (2 in. diameter), called *k'ékua*. A chocolate drink is made by dissolving the *k'ékua* in hot water. A few storekeepers still make disks from ground chocolate purchased from mestizo wholesalers. Today chocolate is taken principally on fiesta days, and is often served to visiting strangers. Other tropical fruits, such as the common banana, mango, pineapple, mamey, chicozapote, zapote prieto, etc., are brought into the Sierra in season. They are eaten at all times and appear to have no ceremonial significance. Pineapple is used for a fermented beverage, *tepache*.

244 Specialized truck gardening.—This is a more recent type of horticulture among the Tarascans. 312 They have adopted intensive commercial production of vegetables in only a few well-watered spots near large mestizo markets. The most notable truck gardening district has developed on the narrow stretches of lacustrine soil along the shores of Lake Pátzcuaro, where irrigation is practiced. Although water is carried in buckets to some of the smaller gardens (e. g., in Puácuaro), most of the vegetable plots are irrigated with the *t'apáratárakua*, or *pala*, possibly a pre-Columbian invention.¹⁰² This instrument consists of a wooden [406] spoonlike container fastened to a long pine pole, which, resting on a crosspiece, is used like a lever to scoop water from ditches or wells (fig. 4; pl. 7). Along the wide western shore of Pátzcuaro shallow ditch wells are dug down to the water level (5 to 6 ft. from the surface), from which water is scooped and distributed to vegetable plots by a system of small canals. Along the narrow shores of the Tarífu-k'éri Peninsula (where the water table is low) small canals have been constructed to permit lake water to flow into a ditch well, from which the water is lifted with the *pala* to high levels. In

¹⁰¹ The latter custom was reported from Charapan and Patamban.

¹⁰² The provenience of the *t'apáratárakua* is not clear. Its mention has not been encountered in colonial documents; the *Relación de Michoacán* (p. 26), however, speaks of irrigated maize, presumably around Lake Patzcuaro. Today the *t'apáratárakua* is used also at Tarajero, in the basin of Zanaqu.

[P. 47-b]

244 addition to the gardens of Lake Pátzcuaro,
3/2 commercial truck farming is also carried on in
La Cañada and in Atapan, but on a smaller
scale. There, fields are irrigated by diverting
water from streams, a technique probably learned
from Europeans.¹⁰⁵

244 The native chile, *jitomate* (tom-kuaraki), *tomate*,
and green beans (*ejotes*) and the Old World onion,
garlic, cabbage, and lettuce are the principal
products of the commercial gardens. Chile is the
most significant of these, in terms of both acreage
and market value. The fruit of this plant, a
vitamin-rich gastrin, has always been important
in the aboriginal diet. Two species of *Capsicum*
are cultivated: *C. annuum*, the common her-
baceous annual, and *C. frutescens*, the perennial
shrub (*chile de árbol*). The latter is cultivated
mainly in the house gardens. Both species re-
quire a long growing season and abundant water;

244 consequently chile cultivation is absent from the
438 Sierra, but is found in the surrounding well-
watered areas. Chile, therefore, has ever been a
trade article between the Sierra and its border-
lands.¹⁰⁶ Tarascan Puácuaro, Uricho, Arúcutin,
and mestizo Tócuaro and Erongarícuaro are the
main chile producers of the Lake. Most of the
La Cañada pueblos raise some chile for export
into the Sierra, but Etúcuaro, outside the valley,
is the largest producer of that general district.
All these areas raise *chile verde*, rather than the *chile*
seco of the *tierra caliente* and Lake Cuitzeo district.¹⁰⁷
In both the Lake Pátzcuaro and La Cañada
areas chile and tomatoes are first planted in the
almáciga, or hotbed, in December.¹⁰⁸ Replanting
in the gardens is done in March, and the vege-
tables are harvested from June through September.

STOCK RAISING AND ANIMAL PRODUCTS

23| Modern Tarascans raise most of the European
animal domesticates. Most households own a
team of oxen for plowing and one or two burros
for hauling wood and carrying produce to market.

Text continues top of P. 49a-49b

¹⁰⁵ In several formerly Tarascan towns in the northern plains area vegetables are cultivated on a commercial scale. The truck farming around Zúñiguero, southeast of Lake Cuitzeo, was significant during the latter part of the 18th century. Tarascan horticulturists of this pueblo carried vegetable produce as far as the Toimca market (AGN Historia, vol. 73, f. 363).

¹⁰⁶ The Tarascan name for Chilchota is *stápu*, which means green chile. The Sierra people have always thought of La Cañada as a producer of chile, as well as other vegetables and fruits.

¹⁰⁷ The chief varieties of *C. annuum* in the Lake district are *fambriño* (*verde*), *amarillo*, and *relleno* (*bell chile*). *Chile seco* from the *tierra caliente* reaches the Sierra through the markets at Uruapan, Pátzcuaro, and Los Reyes.

¹⁰⁸ The *almáciga* is likely a European introduction, although it was pre-Columbian in the *chilampes* district in the Valley of Mexico.

4: West

K-5

(1946) 1948

[P. 48]

NU34 Tarnaco NU34

● 312
406

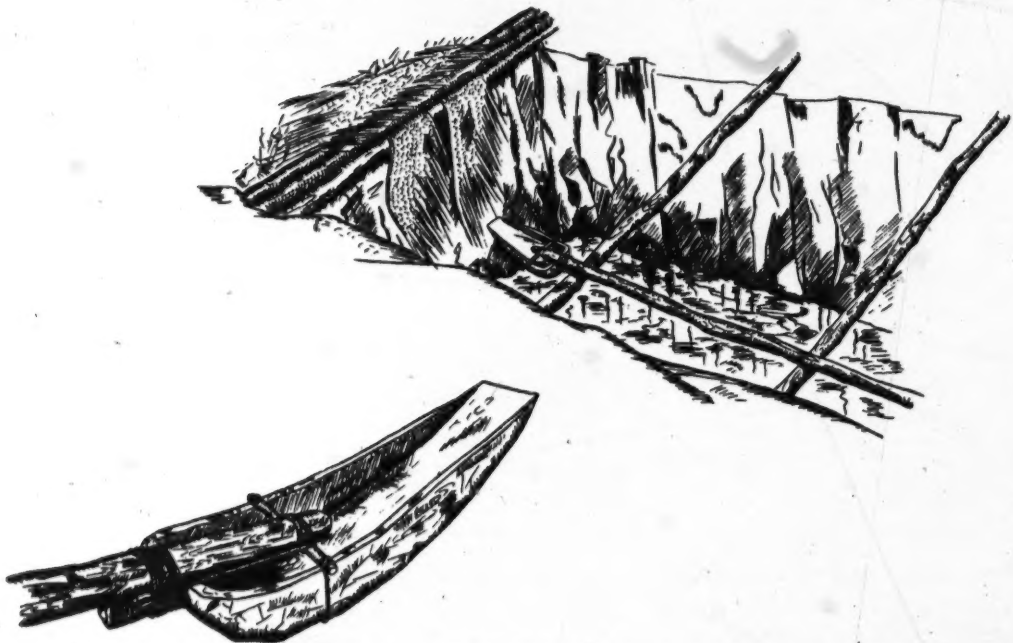


FIGURE 4.—The s'apátarakua irrigation device. The pole to which the wooden spoon is attached is approximately 12 feet long.

312
342
133
361
363

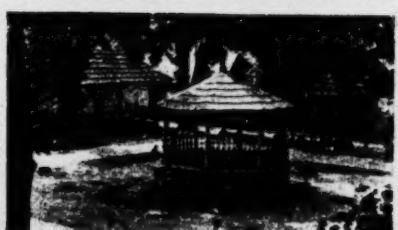
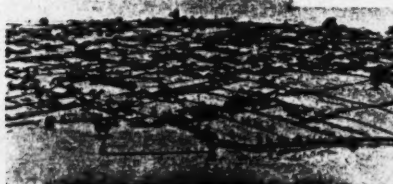
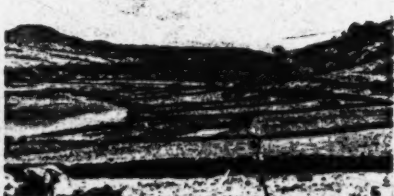
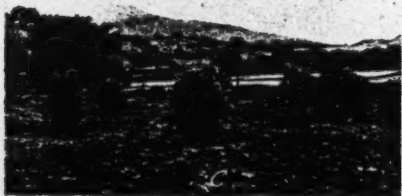


PLATE 2.—Water supply and settlement. a. Wooden aqueduct at Pasmidmaro, which brings water from the local spring (center) to the outskirts of town. b. Hoisting water from one of the public wells in Charapan. c. Street in Iteutele, Lake Pánuco. d. Pasmidmaro on Lake Pánuco, showing compact assemblage of adobe structures. e. Partial view of Zootla near Parícutin Volcano (background), showing grid street pattern, scattered dwellings, and large lots. f. Los Condes (San Juan Nuevo), founded in 1964 to house refugees from destroyed San Juan Pasmidmaro. Nearly all homes were transported from old San Juan and reassembled on the new site. g. Street scene, Charapan (Barrá). h. Street scene, Tláhuera, Acapulco State. i. Plaza at Charapan.

[End-plate 2]

244
231
[342]



[406]
[312]



PLATE 7.—Maritime and domestic scenes. a. Large paved stadium, San Felipe. Note column 1 pen collecting fruit. b. Small patch of cabbage in home lot, San Felipe. c. Vines of chayote in orchard, Tancapilla, La Cofradía. d. Irrigated vegetable plot along west shore of Lake Titicaca, near Arequipa. e. 1000-watt coil and poles (Tupac Katari) used to fill water from ditch to irrigate fields. Near Orisho. f. Sheep grazing in harvested maize field, near Yancay. g. Herding sheep near summit of Cerro de Putanaka. The flock is from the rancho of Urinagaita. h. Two boys in home lot, Arequipa.

[End-plate 7]

539
823

At daybreak the astonished king and warriors beheld, instead of a flourishing valley, a lake whose waters formed the shape of a heart.

These things occurred many years ago, but each morning Father Huriata continues to kiss with his first rays of light the crystal-clear waters created by Princess Hapunda, the beautiful "Tzinzi-quin."

QUIRITZÍCUARIO (THE GREAT FOUNTAIN)

Historical Comment

312
[539]
[361]

The legend of Quirizícuario refers to one of the most significant factors in the life of the Tarascans—a needed spring to furnish a constant supply of fresh water. Almost every town in Michoacán is located beside a lake or is near a spring. While the territory to the north and to the south of La Sierra abounds in springs, their scarcity in La Sierra itself has always been a problem. In pre-Conquest times, many towns supplemented the flow from the local spring by constructing aqueducts of hollowed half-logs to bring in water from springs some distance away. This method is still used in many of the pueblos of La Sierra.

312
584
[178]

The discovery of a new spring has been charmingly linked with a tradition existing for centuries in the highland pueblos of La Sierra, where the young people carry on their limited courtship while walking to and from the water fountain. The maiden loiters and gazes across the fields, never facing her suitor directly, and listens as he talks to her. His presence on the road to the fountain, although understood by the townspeople and usually prearranged with the girl, must give the appearance of being quite accidental.

361 The pueblo of Paracho, referred to in the legend, is one of 49 three significant Tarascan villages on the road that leaves the 539 main highway at Carapan and winds southward for forty-five miles through pine and oak woods and small cultivated valleys to Uruapan (Fig. 1). Paracho is still primitively picturesque. The town's

LEGENDS

17

ancient art of guitar making has aided in the preservation of folk songs and possibly folk tales.

The Town's $\frac{2}{1}$ 182
534
438
533
538

The Legend

The pretty Tzintzin, the modest and genteel priestess of the sun, unwittingly tantalized the young Tarascan warriors with her deep red lips and brilliant black eyes. As was her custom, she went out one day with her empty jar on her shoulder to obtain some water from the fountain. 539
312●

The Tarascan region was famed for its beautiful young maidens. However, among handsome young men it was the mention of Tzintzin's name that inspired the most ardent emotions, wild desires, and impossible aspirations — impossible because her heart already had been given to a young huntsman. The fortunate youth was the elegant Quanicori, the best hunter and warrior in the kingdom. He wore the most beautiful skins and feathers in Paracho.

The souls of the young priestess and hunter were united in love as pure as the fragrance of flowers, as clean as the breath of spring. However, their devotion was as impetuous as the rushing waterfall in the Tzaráracua stream, falling in multicolored ribbons as in homage to the gods.

That afternoon as Tzintzin walked through the forest, her lover awaited to offer her the prettiest flower in the meadow and to help her carry the water home. Upon sighting one another, the eternal dialogue of love, the same in all ages and all languages, began its course.

As usual, time passed rapidly without the two lovers noting the lowering of Father Sun in his course through the sky. Always such tardiness evoked reproaches from Tzintzin's venerable parents. This afternoon the lovers were so engrossed in words of love that Father Sun approached the horizon and hid behind a rose-colored cloud. Gently the song of the nightingale fell upon the ears of the happy couple. Tzintzin gazed lovingly upon her lover as he left her.

Suddenly, in anguish, Tzintzin realized that the time had $\frac{2}{1}$ [i.e., Paracho -- Analyst]

539
 312 passed and she had not gone to the fountain and filled her empty jug with water. She fell to her knees and directed her gaze at the rose-rimmed cloud hiding Father Sun. Tearfully, she prayed that the god would enable her to discover water nearby, so as not to incur the anger of her parents.

Her supplication was humble and sincere, because Tzintzin was a good girl. While she remained on her knees, a small beautifully colored bird arose from the center of a cluster of flowers. At that instant the last rays of Father Sun broke through the cloud and revealed drops of water which shone like diamonds falling from the feathers of the rising bird. This was the sign Tzintzin sought.

She parted the flowers and gazed into the pure, clear depths of a beautiful and hitherto unknown spring. Filling her jar, she returned home. Her parents were greatly surprised to see her return so quickly [she actually was late but the narrator said "so quickly" to emphasize the nearness of the new spring] and they supposed that Quanicoti had aided her with the water jar. However, she explained that she had discovered a new fountain of water near the road where her people traveled for decades.

The news of the fountain spread. The people from neighboring villages came to see the new source of water. Its depth was such that they called it Quiritzicuaró (the great fountain), and it still exists today to the east of the village of Paracho.

Always when the pretty Tzintzin visited this spot to hear Quanicoti's protestations of love, Father Sun smiled approvingly upon them with his brilliant, profound eye.

HUANITA

Historical Comment

173
 174 In "Just as the Birds," the narrator spoke of one group of Tarascans who travelled northward to settle upon the rocky hill of Zacapu. At some uncertain time in the twelfth century, these [648] Tarascans conquered the people of Naranjo and then moved south-

11: Boyd H-4, 5 (1953) 1958
 [End Plate 3] NU34 Tarasco NU34



341
 342
 291
 115
 854
 493
 122



363
 341
 312
 367

Plate III. Views in Morelia

Upper, Ignacio Peña, narrator of the myth of creation, in front of author's apartment.

Lower, Spanish aqueduct built to bring water from mountains to city.

[177]

313

313 LUMBERING--kinds of timber exploited; gathering of firewood; logging operations (e. g., felling, trimming, hauling); techniques and apparatus used; saw-mills and pulp mills; economic importance of lumbering; organization of labor and production; forestry science, practices, and policy; etc. See also:

Forest resources	137	Industrial structures	348
Conservation policies	185	Fuel	373
Silviculture	245	Lumbering machinery	402
Paper manufacture	289	Tools	412
Woodworking	322	Moving of heavy weights	483
Building supplies industries	339	State and national forests	659

[p. 15b]

312 troughs and pipes (pl. 3, upper left). Large tanks exist in the approximate center of town, and water is also piped to a fountain in the plaza. The troughs leak, however, and in some places are low enough to permit water to be dipped directly from them. In consequence, if the flow is small, water may not reach the tanks in sufficient quantity. The lower portion of the town receives no water directly and the effort of obtaining water in those sections, particularly the southwest district, is considerable.

FOREST UTILIZATION

313 The forests are one of the important and most utilized natural resources of Cherán. Firewood, charcoal, posts, railroad ties, shakes, and lumber of various sizes are secured from the woods. Forests cover a very large part of the Cherán lands and most of the timber is on public domain, although some forest patches may occur on privately owned land. The public domain is regarded as belonging to the town, and the Federal Government levies a nominal [651] land tax on the community for the forest lands. Each head of a household pays a fee (*rústica*), usually 25 centavos a quarter, which is collected by a committee on community property (*bienes comunales*). This sum covers the taxes and gives each person the right to cut firewood from public lands. Persons exploiting other forest resources pay more.

656 Until recently utilization of other forest
313 resources was also open to everyone. The Department of Forestry of the Federal Government is now attempting to control the exploitation of the forests, and since 1940 any use of the forest for purposes other than cutting firewood requires a permit. In 1941 an effort was being made to restrict all lumbering and charcoal burning to members of a cooperative. This is discussed later.

[556] With the exception of a few wealthy persons, everyone who is not lazy cuts his own firewood.*

[438] *This is general even in such Mexicanized towns as Chilchota.
[435] In the latter town, however, there is some selling of firewood.
[563] During planting and harvest times the price is \$0.25 a carga (burro load in this case); the rest of the year it is \$0.25 a carga. Some people in Angahuan make a business of taking firewood to Matías Romero; similar ones occur in villages near Matías town. Ocoté (pitch pine), used principally for light, is also produced by the householder in Cherán. A long vertical cut is made on one side of a tree, which is gradually cut away as pitch accumulates. The tree is rarely cut through, but it usually dies from the operation. In Chilchota, where ocoté (pitch pine) is sold,

[text continues on p. 17a]

INSTITUTE OF SOCIAL ANTHROPOLOGY—PUBLICATION NO. 2

322

4/2

3/3

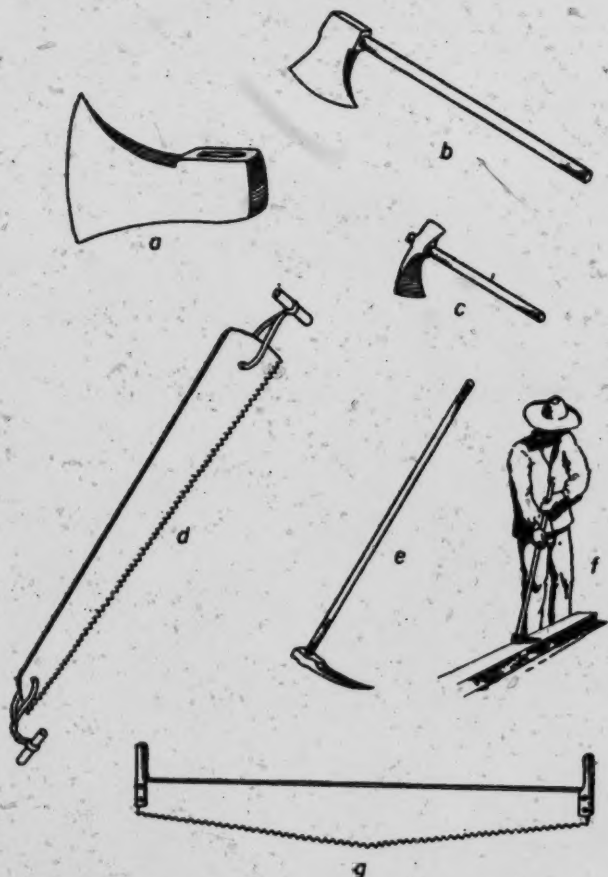


FIGURE 1.—Woodworking implements. *a*, Typical ax head, weighing 6 to 8 pounds. *b*, Same as *a*, with handle; total length about 3½ feet. *c*, Short-handled adz (sagáru). *d*, Saw used for cutting planks (k'óreri arákutarakus), about 6 feet long; the lower handle usually is of metal and clamps over the end of the saw, engaging the saw teeth to hold it in place. *e*, Long-handled adz. *f*, Method of using long-handled adz to dress beams or planks. *g*, Logging saw, "sardine," used to cut felled timber into desired lengths.

[p. 16]

[p. 17a]

313 Consequently, every Cherán male is a fairly competent axman and in a pinch can produce other forest products. Oak is considered far superior to other woods for burning, but it is becoming scarce near the town. The best supply is near El Pilón, several kilometers away.

With some exceptions, most skilled woodsmen work only when they have to fill definite orders. In other words, no stock of lumber or shakes is accumulated against possible future sales. Lumber or shake workers usually are farmers who supplement their income by forest products when opportunity offers. Not infrequently one or two members of a large household do lumbering but help in the fields when necessary or when unoccupied.

[824] Pine is the main wood used for lumber, and fir for shakes. Trees ordinarily are cut with the ax (jáca). Trunks are cut in sections with a saw ("sardina") (fig. 1, g), which is operated by two persons. The trunks are cleared and debarked with the ax. The trunk is then squared by splitting off slabs ("tachones"), with oak wedges some 20 cm. (8 in.) in length driven by an oaken maul or the butt of the ax. The slabs are used for firewood or fences. Thick planks called "vigas" (anything over 2 [40] inches in thickness) are then split out with wedges. Before use, heavy planks usually are dressed with a long-handled adz (angáru) (fig. 1, e). Thinner pieces, tablas (k'eréri), are sawed from squared sections of logs (pl. 4, upper right). The logs are elevated on a scaffolding of poles (or sometimes laid on poles across a saw pit) and sawed out by a saw (k'eréri ajákutarakua) about 2 m. (6 ft.) long and wider at one end than at the other (fig. 1, d; pl. 3, upper right). The handle at the wide end is fixed, and that at the narrow end is hooked over the teeth of the saw. Before sawing, the block of timber is marked with a cord used like a chalk line but employing charcoal instead of chalk. All the planks from a block of timber are usually sawed about two-thirds of the length of the block; work is then begun at the opposite end. Planks customarily are

[438] 1 centavo buys a thick piece. In Parangaricutiro, partly Mexicanized, there is some cutting of firewood as a business. In one case a father and three sons, 10, 12, and 16 years of age, cut a cord a day (16 cords), which sold for \$1.50 (all monetary values are in Mexican currency). In Paricutin two widows without grown sons buy firewood. The women are not poor.

[435]

[563]

[p. 17b]

- 313 about 1 inch thick, 6 to 8 feet long, and 6 to 8 inches wide. Planks cut from timber with a heavy pitch content are said to last longer.

Beams are usually squared sections of red (heart) wood. They are used primarily for foundations and joists and are split out by wedges.

- [438] An important product of Cherán is shakes, *tejamanil* (tasamani). The product is all exported, mostly to Zacapu. Some is also taken to Uruapan. Pine is rarely used for shakes, as the product curls during dry weather and is not as durable as shakes made from fir. However, fir shakes are more brittle. Fir trees grow only sporadically among the pine forests and must be searched for. Once a tree is found, the shake maker examines it carefully, studying the position of branches and estimating the probable straightness of the grain. If the tree does not look promising, it is left. Even after a tree has been felled with the ax, it may prove unsuitable for shakes. In this case it may be hewed into a beam, but it is more apt to be abandoned.

- [401] If the tree proves suitable, it is cut in lengths with saw or ax and the bark is removed, together with any rotten or insect-eaten portions. Each length is now split in sections (*péri*) with a wedge, *cúia* (injárukua). Each section has a width of four fingers at its outer edge, and a tree of average size will produce eight sections. One end of each section is then marked with a machete along the radii of the trunk. The section is first marked in the middle; each half is then divided in two, then each quarter, until 16 divisions are marked. At each mark the machete is driven in with blows of an oaken club to a depth of about 5 cm. The shakes are then split off with an oaken instrument called a *rajador* (uáguá). (Pl. 3, lower right and left.)

- [804] The completed shakes are thin and wedge-shaped when viewed in cross section. After drying in the sun for 2 or 3 hours they are tied into bundles of 400 called an *irépita* (400 in Tarascan). They are transported and sold by the bundle, the price varying according to the length. Different villages and Mexican markets have preferences for different lengths, usually 4, 5, or 6 cuartas.*

* A cuarta equals $\frac{1}{4}$ of a vara (the standard measure of length, about 33 inches long).

[text continues on p. 19a]

[p119a]

313 Cherán prefers shakes 5 *cuartas* in length,
 304 called "thick shakes" (*tasámani tiápití*).
 438 Shakes of 4 *cuartas* (1 *vara*) are sold primarily
 in Uruapan and are spoken of as *de comercio*,
 or "small shakes" (*tasámani sapirati*). Shakes
 6 *cuartas* long, preferred by some Tarascan
 towns, are called "long shakes" (*tasámani*
ídrati). In Angáhuau, shakes 5 *cuartas* long are
 sold in Zamora and are sometimes called
 Zamorana.

313 Shake makers usually work from 8 a. m. to
 6 p. m. A week's work routine is as follows:
 On Tuesday suitable trees are sought and felled.
 Wednesday is devoted to cutting trees in sec-
 tions. Thursday and Friday the timber is split
 into shakes. One day is spent drying the shakes
 in the sun, and, if the maker is a professional,
 the finished product is taken to Uruapan or
 Zamora on Saturday and Sunday for sale. On
 this schedule one person might make two bun-
 dles of 400 shakes (two *irépitás*) in a week.

313 Railroad ties are usually made under contract
 439 arrangements. The workers leave town on
 397 Tuesday, usually arriving in time to cut a
 week's supply of logs for splitting and shaping.
 Wednesday, Thursday, and Friday are spent in
 splitting and shaping the ties with the ax.
 Saturday the ties are checked by the contractor,
 and the men are paid in time to return home
 that night.

313 A minor industry is cutting out blocks of
 322 *madroña* and *jaboncilla* wood. These are sold
 438 in Paracho, where they are made into doors,
 spoons, wooden bowls, and the various small
 wooden objects for which Paracho is famous.
 A few people in Cherán also make broom
 handles.

314 A considerable amount of charcoal is pro-
 duced on the more distant lands of Cherán.
 Several men in town make their living entirely
 from charcoal burning. Oak is used almost
 exclusively for charcoal. Charcoal burners
 usually spend from Monday until Friday in the
 woods, and return home over the week end.
 Charcoal is usually sold in the woods to dealers,
 the unit of sale being a stack 8 by 7 inches
 by 6 feet.

In a number of Tarascan towns turpentine
 production is an important industry. This has
 been true of Cherán in the past, but for rea-
 sons not discoverable, output at present is

471 Ownership of livestock similarly poses ques-
 556 tions. The wealthy man who keeps a considerable number of bulls whose main use seems to be to enhance his social prestige by having the bulls selected for riding at a fiesta may also sell them for beef if he needs money for productive enterprises. Sheep are capital in much the same sense that land is capital. A yoke of oxen or a burro may be used to aid production and are also rented. A horse, on the other hand, is close to a "conspicuous expenditure."

471 Probably the minimal capital required in Cherán is for the production of certain services. A water carrier needs only two 25-liter oil cans, a bit of rope, and a piece of wood to make a yoke. A *tabla* maker (one producing heavy hewn planks or beams) needs only an ax and some oak wedges he cuts out himself, and 10 [913] pesos to join the cooperative (formerly he would have needed only enough to pay the tax for use of communal lands). A digging stick and a knife would suffice to gather *raiz de paja*, while herbs need only a bit of cloth to tie them in. At the other extreme are the owners of threshing machines, *nixtamal* mills, or trucks, the latter requiring a cash outlay of between 8 and 10 thousand pesos.

For the farmer, aside from land, very few capital goods are necessary. Ox teams and plows may be rented and paid for out of the crop; even land may be secured on a sharecrop basis. A special *machete* for weeding is, in fact, the only indispensable tool. Such farming, however, will bring a relatively small return, probably little, if any, more than could be earned by a hired laborer.

At the other extreme, a landowner, farming his own land, should own an ox team, yoke, plow, *machete*, burros, and nets for transporting the crop, adequate storage facilities, and sufficient cash to hire labor at crucial periods such as planting and harvesting. A man so situated will reap the best possible return from his labor.

The major investment of a farmer is in land, storage facilities, and livestock. His ox yoke and plow he may make himself, and the few metal tools needed are not costly. In general, the investment in tools and equipment is much less than that required in manufacturing or some service occupations. A sewing machine

236 year, or a total of \$442.50 to \$492.50 a year.
434 Deducting expenses of \$345 leaves a return on the investment of \$107.50 to \$147.50. As indicated before, these figures are suspect.
[124] The owner of this flock is not believed to be very truthful on financial matters. For example, he claimed to own 20 sheep; Augustin Rangel said he had over 200. He is, though, a hard-headed storekeeper and farmer who would not keep sheep if they were not profitable. The most suspect item in the calculations is the amount of wool per sheep.

231 The evaluation of the role of the burro is as difficult as in the case of oxen. Burros reduce
434 the cost of numerous operations by saving the rental of animals, they facilitate such tasks as bringing in wood (which otherwise would be carried in by the woodcutter rather than on rented animals), and they may be rented. Burros involve little investment—\$30 to \$40—but they do require attention while in pasture and the provision of feed when kept at home. Although burros not in use are often lent, they
[427] sometimes are rented. Information on rentals is contradictory; at the harvest season, when demand is highest, rentals are probably about 50 centavos a day plus feed for the animals.

313 The ensuing topics are dealt with in summary form to bring out the essential factors of
434 capital, labor costs, cost of materials, and income.

WOODWORKING

Shake making:

Tools:

Ax, wedges, machete, splitting tool

Product:

[435] ½ irepita (an irepita, or bundle, is 400)
a day at..... \$5.00
Profits (return on labor, less interest on capital, etc.) \$2.50

Comment: Shake making is a well-paying occupation, but profits are less than the data above suggest. Shakes are made either only to order or are sold in Uruapan or some other Mestizo center. In the latter case the man may work regularly, but must spend 1 or 2 days a week taking his product to market. Neither does the estimated result for a day's labor include the time spent searching for a suitable tree. Usually only a 5-day week or less is worked and the season is confined to the rainy period. As a result, shake makers must shift to other work, such as plank making, tie cutting, farming, etc. The term "profits" is loosely used throughout, as wages are often included.

[A 70a]

Sierra Tarascan

Plank making:

313
433
434

Tools:

Oak mallet
Oak wedges
Ax
Two-handed saw

Expenses:

Haulage (ox team, horse, or even burros)
Forest use tax (now 10 pesos for membership
in cooperative)

Production (with good workmen):

3 dozen planks per week

Gross profits:

\$0.85 to 1.25 per day per person

Comment: Sawing planks requires two men, hence work is done by teams. The gross profits probably are very nearly all net, as deterioration of equipment is slight. Maintaining an average income of the larger size indicated would require 6 long work days a week for the most skilled workers.

Firewood cutting:

Some men at times cut firewood for sale. A burro load brings \$0.25 to \$0.30.

Tie cutting:

Data on this subject seem unreliable and are omitted.

Charcoal burning:

314
433
434

Beyond the fact that charcoal burners work a 5-day week, no economic data were secured. The little charcoal used in Cherán is sold at 2½ to 3 centavos a kilo delivered.

Carpentry:

395
433
434

Tools:

Mallet, saw, chisels, hammer, ax, adz, plane;
value about \$20-\$30

Products, labor, value:

As each carpenter's job is unique, only a series of cases can be given, as follows:

- [435]
- (a) Large door takes 4 days (10 to 12 hours daily), lumber cost \$4, selling price \$17, gross profit \$13, daily return (not allowing for interest on capital, etc.) \$4.25.
 - (b) Average door takes 4 days (6 to 7 hours daily) lumber cost \$4, selling price \$12, gross profit \$8, daily return \$2.
 - (c) Average door takes 6 days (but this carpenter has rheumatism and cannot work steadily), selling price \$5 a door if lumber is furnished, daily return less than \$1.
 - (d) House building or house moving, \$1.50 daily (if done under contract, as usual).

Comment: As only carpenters with other members in the family to get wood, do chores, look after animals, etc. can work more than 6 or 7 hours a day, probably \$2 a day is top income. Moreover, as work is not steady and as all seem eager to take house building or house moving jobs at \$1.50, it may be assumed that average wages the year around are less than \$1.50.

[465]

632 district commander to arrest all strangers and
625 send them to Uruapan. So far as I could learn,
nothing was done.

632 *Representative of the people.*—The represent-
ative of the people or *representante* is named by
the people at a town meeting along with two
other persons, forming an administrative com-
mittee. The representative is the *presidente* of
the committee, another is a secretary, and the
third is an ordinary member or *vocal*. The ap-
pointments are confirmed by the Governor and
last until the people elect new ones at another
junta or town meeting. None of the members
receives any pay but the work is not onerous.
Usually signing a few papers is the major duty.
The reward, according to one member of the
committee, is in being selected as one of the
best "elements" in the town.

632 The collection of funds for use of the forest
651 lands is done by the inevitable *comisionado*
system. With the approval and, if necessary,
the backing of the mayor and *ayuntamiento*, the
committee names the *comisionados* who collect
28 centavos from each householder every 2
months for the right to cut firewood on public
lands. This money is used to pay the Federal
taxes.

632 At present no one is supposed to cut wood
313 for lumber, charcoal, posts, etc., without secur-
[474] ing a permit from the forestry service. (As
indicated elsewhere, efforts were being made to
concentrate all activity in the hands of a
cooperative. The description here is of condi-
tions before organization of the cooperative.)
To prevent unauthorized exploitation of the
forests by Cherán residents, or poaching by
persons from other towns, a forester is em-
ployed to patrol the woods. The source of pay
of the forester is obscure, but he is entitled to
make use of a certain amount of fallen timber
on his own account and if he encounters
poachers from other towns (such as Zacapu,
Carapan, and Purépero), he may either con-
fiscate their products and sell them or charge
the poachers 20 or 25 centavos for each burro
load. The proceeds are kept by the forester.

632 The institution of the *representante* is rea-
sonably old; at least it has been in existence as
long as men now living. While the representa-
tive apparently has no official responsibility, if
things go wrong he is blamed. In 1939, a

tion. It was, indeed, difficult to imagine him as the leader of a bloody riot.

As a final footnote on the affair of the "agrarians," one of the first acts of the new government installed in January, 1941, was to send letters to all the members of the agrarian group, inviting them to return to Cherán and guaranteeing their safety if they refrained from political activities. This was done with the approval, if not at the actual instigation, of Valenzuela.

An entirely different type of organization the cooperative. Essentially an economic organization, it deserves treatment here because it potentially might yet have important political repercussions. Although not openly opposed by anyone in hearing of the staff of the study, comments made by several men while drunk implied great bitterness on the part of some of the people in the town. The cooperative, still in process of formation in 1941, was organized under the leadership of one Valentin Velásquez. Velásquez was not dressed in typical Cherán fashion, and he had spent several years in the United States. He speaks typically Cherán Spanish, however, somewhat in the manner of the famous screen comedian, Cantinflas—he never finishes a sentence and only after several sentences is it apparent what his ideas really are. He is an orphan who has bettered himself economically at the cost of terrific effort, according to his own story, and his interest in the cooperative, he claims, is merely that of a good citizen who feels it his duty to aid others to better their lot. By his own admission there is a good deal of opposition to the cooperative, and he has been threatened with death several times. He lays this opposition to ignorance.

The organization of the cooperative would give it a monopoly on all exploitation of forest lands except for cutting of firewood for personal use. The cooperative would charge a membership fee of 10 pesos, and members would be required to market all their products through the cooperative. Only the cooperative would be licensed by the Forestry Department and all work would have to be done in areas designated by the Forestry officials, using care not to destroy young trees. Members would receive better prices for their products through

474 the bulk marketing and better bargaining power
 313 of the cooperative. In 1941 it was claimed
 that a considerable number of the individuals
 working in the woods had signed up, as well as
 some men in the town who wished to indicate
 their support of the idea although not them-
 selves forest workers.

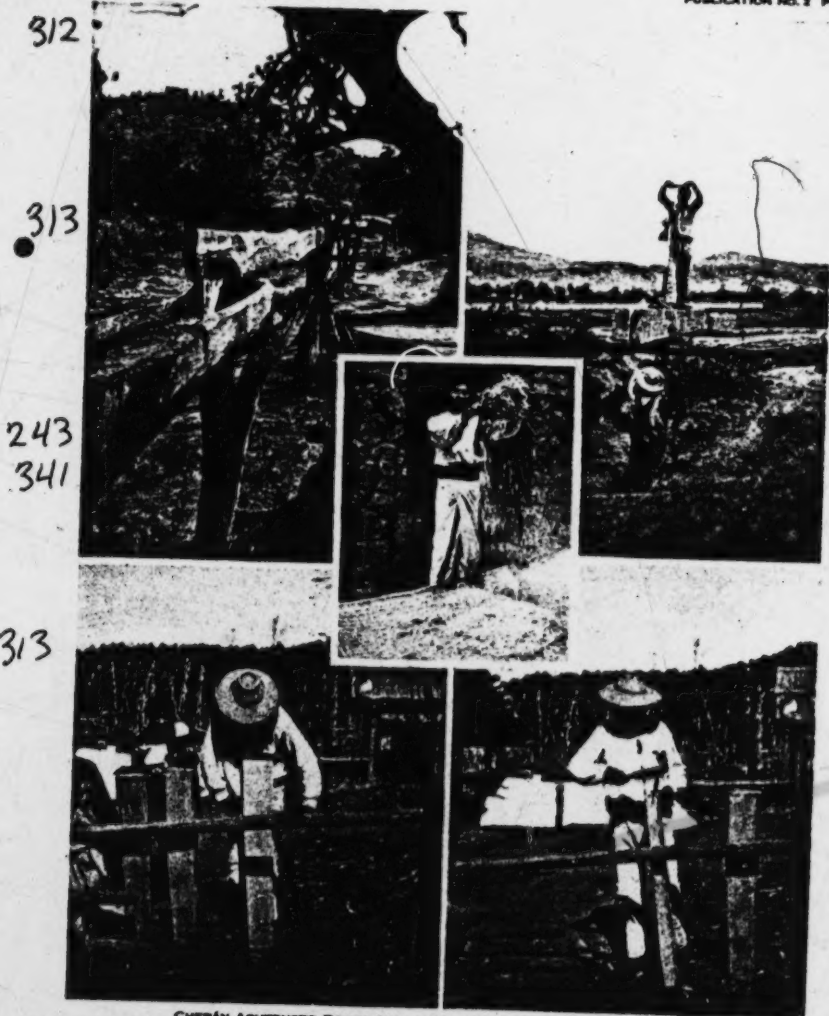
474 Two things were said to be holding up the
 completion of the organization of the coopera-
 tive. The first was the necessity of raising
 enough capital to pay advances to the members
 when they deposited their products with the
 cooperative for marketing. The second was the
 refusal of the *representante* to sign the necessary
 papers. According to Velásquez, this refusal
 was not because the *representante* disapproved
 of the idea, but because he felt many people in
 town were opposed and he did not wish to sign
 the papers counter to their wishes. As the
 signature of the *representante* was not abso-
 lutely essential, the organization probably was
 completed without his approval.

It may be noted that the cooperative had
 nearly come to grief in its early days through
 an action by the *presidente militar* imposed
 after the 1937 *zafarrancho*. The military
 governor had ordered posts cut for the installa-
 tion of the electric lighting system without
 securing a permit from the Department of
 Forestry. The Forestry officials had blamed
 [687] this on the cooperative, levied a thousand peso
 fine, and threatened to revoke the permit of the
 organization. This had been cleared up, and it
 was rumored that the former military governor
 was going to have to pay the fine—which may
 very much be doubted.

575 A number of other organizations of a relig-
 794 ious nature exist and will be dealt with later.
 578 Potentially most influential in political matters
 668 are the church societies such as those of the
 Sacred Heart, the Third Order of Saint Francis,
 and others. In Cherán in 1940, it was difficult
 to learn much about these. The meetings were
 private, and secrecy had been impressed on the
 members. There is very little doubt that a
 new priest who took over the parish late in
 1940 was utilizing these organizations to under-
 mine the existing liberal political order in
 Cherán. Trouble was brewing in Cherán
 on the religious and political front and
 there is little doubt that it was being con-

INSTITUTE OF SOCIAL ANTHROPOLOGY

PUBLICATION NO. 2 PLATE 3



CHERÁN AQUEDUCT, BOARD SAWING, SHAKESPLITTING, AND WHEAT WINNOWING.
Upper (left): The Cherán aqueduct, east of town. Upper (right): Sawing planks with sawpit. Often, the timber is raised on a pole framework instead of being placed over a pit. Lower (left): Splitting off a shake with a rajador. Lower (right): Starting to split a shake with a machete struck with a wooden mallet. Center: Cherán man winnowing wheat.

[End Plate 3]

241
492
133
137

313



417
342

291
443
516



PLOWING, DITCHES TO PROTECT FIELDS, LOG HEWING, AND CHERÁN PLAZA DURING FIESTA.

Upper (left): Plowing on the plain. Augustin, at the plow, wears felt hat, shirt, trousers, belt, and shoes; workman at left, less acculturated, wears straw hat, sandals, and mechanic's overalls. Upper (right): Squaring a log with an axe before sawing it into planks. Lower (left): A hill-slope field, with new ditch (center) and overgrown bank surrounded with thorny brush (foreground) to protect it from animals. Agaves are planted on right of ditch. Lower (right): Portion of Cherán plaza during the fiesta of the patron saint.

[End Plate 4]

BUILDING MATERIALS AND THEIR SOURCES WOOD

- 313 All wooden materials used in Cherán are produced from local timber. The forests stand almost entirely on public lands considered to belong to the town. Formerly, exploitation of any sort was open to all residents who had paid a small fee to an administrative committee. The fee was used to pay federal taxes on the land. Recently, the Department of Forestry of the Federal Government has restricted exploitation of the forests for any purpose other than the collection of firewood to persons having permits. In Cherán this apparently will mean that persons wishing to cut [474] lumber or shakes (or make charcoal) must join a local cooperative, for the Department of Forestry has refused to give permits to any other group or to individuals.

- 313 In general, the cutting of lumber is done by specialists. Men who have no land or inadequate land or, in some cases, men who prefer the activity, cut most of the timber and shape it into planks and beams. Shake making is even more specialized, and men who make shakes may do nothing else except look after whatever farm lands they may own. Only a very poor person would attempt to cut the planks and beams needed for a house if he were not a specialist, but anyone might cut poles and stringers used in the roof construction.

- 313 Woods used in house construction are pine and fir. Pine is most used and two types are distinguished, red (*iañini*), the heartwood of large trees, and white, the sapwood of large trees or wood from young trees. From these woods are made shakes, *tejamanil*, "*vigas*" (any piece over 2 inches (5 cm.) in thickness), and planks, or *tablas*.¹

- 313 Trees are felled and trimmed with the ax. To cut trees in sections, a two-handled saw is used called a "*sardina*." Splitting is done with oak wedges and an oak maul. Large pieces produced in this fashion are sometimes dressed down with ax or adze. Planks, or *tablas*, are sawed with a long two-handled saw (*k'eréri ańakutarakua*). Logs destined for planks are squared with the ax, marked

¹ The measure of length is the *sars*, which is divided in fourths or thirds. Each fourth contains eight English inches (20 cm.); so the *sars* equals 32 inches, or 81.28 cm. Fourth and inches are measured usually with the hand and fingers, but the span is also used.

BUILDING MATERIALS AND THEIR SOURCES

313 by a chalk line, and then placed on a platform of
poles, sometimes with a pit underneath.³

412 Shakes, *tejamanil*, are made from both pine and fir. Fir shakes are preferred as they last longer despite breaking more easily. Trees used to make *tejamanil* must be straight-grained. The trunk is cut in sections with saw or ax; each section is then split lengthwise with wedges to produce a number of pieces, usually 8, each 4 fingers wide at the bark edge. These pieces are then split into 16 shakes. A special machete is used to start the split, which is then completed with a thin metal or wooden tool.

313 Several types of shakes are made. In Anga-
huan, a shake 5 *cuartas* (40 in.) long and 7 inches
438 wide is made to sell in Zamora and is called Zamorano. One shake 4 *cuartas* (32 in.) in length by 4 inches in width, called "little shake" (*tasámbani sapíratí*), is sold in Uruapan, while one called "long shake" (*tasámbani íorati*), 6 *cuartas* (48 in.) by 1 *quarta* (8 in.), is used in the town itself. Cherán, on the other hand, uses a shake called "thick shake" (*tasámani tiápití*), 5 *cuartas* (40 in.) in length. This is the size used in most Tarascan towns. Shakes are occasionally sold by the hundred, but the most common unit is a bundle of 400 (*irépita*).

412 Master carpenters may use an elaborate variety of modern tools for woodworking and house building. However, everything may be done in woodworking with ax, adze, saw, drill, chisel, and wooden wedges, and many persons work only with these tools.

ADOBE BRICKS

339 Adobe bricks are usually made from suitable earth near the village by specialists. The earth is mixed with manure and water to the proper consistency, then shaped in wooden forms. Two sizes of brick are made, one 3 spans long, one 2½ spans long. Adobes are laid by a mason in a mortar of adobe and manure. Because of the moist
333 climate, adobe walls always rest on a foundation of stone masonry laid in adobe mortar; the foundation may extend as much as half a meter (20 in.) below the ground surface.

³ A fuller description of lumbering techniques will be given in a general monograph on Cherán in preparation.

312 times many towns supplemented the scanty flow from the local spring by constructing aqueducts (*dekákua, canoes*) of hollowed half-logs to bring in water from large springs some distance away. Furthermore, wooden reservoirs caulked with pine pitch were constructed at springs to conserve water during the dry season (Mus. Nac., leg. 102, Rel. de Chilchota, f. 10v.; Ponce Relación, vol. 2, p. 6). Wooden aqueducts are still employed in many Sierra pueblos to conduct water from springs to the village outskirts (pl. 2).

The progressive exhaustion of springs constitutes one of the most urgent welfare problems in the Sierra today. Scarcity of water in that area, however, is no modern difficulty, for during the 18th century many pueblos were sorely pressed in the dry season (AGN Historia, vol. 73, ff. 212-226).

• [313] The present scarcity has been aggravated by continuous destruction of the forest. Some towns have partially solved the local water problem by digging wells in the adjacent basin flats. Nurfio and Urapicho, whose springs have long been dry, obtain water from a common group of wells in a large basin nearby. Located within a basin, Párho has always obtained water from wells. Moreover, the peculiar geological structure of Charapan's bench site has permitted the development of water-bearing strata beneath the town. These strata are now tapped by private wells dug in the house lots and public wells in various parts of town (pl. 2). Even the water level in wells is continually diminishing. During the dry season water must be carefully rationed to the inhabitants and their livestock. Other pueblos, which are located far from water-bearing strata in the basins and have springs that cease to flow in the dry season, suffer even more. The women of Azajo travel with burros 8 km. to San Jerónimo on Lake Pátzcuaro to fill their *cdáwos*, and those of Ocumicho walk 3 km. and many from Patamban go 8 km. to the large spring at San José for water. Few towns have received Federal or State aid for the improvement of the local water supply; on their own initiative the people of some pueblos (e. g. San Felipe) have constructed concrete reservoirs to store spring water and have installed pipe to carry water to various points in the village. The majority of the towns, however, lack sufficient resources to improve their plight and continue to suffer through the dry season.

226 another without permission from the authorities of the latter.

252 **Fish preparation.**—*Pescado blanco, trucha*, and *akúma* are usually taken to market fresh, although the latter is sometimes fried on the *comal* before being sold. The tiny *k'uerépu* and *é'arári*, however, are invariably sun-dried, the catch being spread on a petate, which is placed near the door of the dwelling where it can be easily watched (pl. 11). Since pre-Conquest days dried *é'arári* has been one of the main exports of the Tarascan lakes. It was distributed into the *tierra caliente*, the Sierra, and as far east as Toluca.

LUMBERING ACTIVITIES

313 The Tarascans, possibly more than any other aboriginal group of Mexico, have been exploiters of forest products since pre-Columbian times. During the Empire period one of the important officials of the *caltzontzin* at Tzintzuntzan was in charge of "the keepers of the forests," who cut beams and made planks for public, and probably private, use.¹²⁶ Not only were large beams and logs used in the construction of temples, but also in the building of forts against Aztec raids. During the colonial period the pine forests on the northern flanks of the Sierra de Ozumatlán were heavily exploited by Tarascan woodmen for beams, planks, and shakes for the Guanajuato and Zacatecas mining districts.¹²⁷

Much of the timber resource of northern Michoacán was depleted by the end of the 18th century. Relatively untouched by colonial exploitation, the pine and fir forests of the Sierra de los Tarascos, although constantly diminishing, have remained the principal source of timber for the indigenous population. There are few contemporary Sierra Tarascan men who cannot handle an ax or lumber saw. When the maize fields do not demand their attention, the family head and his sons are usually in the forest cutting timber or gathering resin. The Sierra Indian is consequently both a farmer and a lumberjack. Some are professional woodsmen, who live in the village but seldom engage in agriculture. Little lumber-

¹²⁶ *Relación de Michoacán*, p. 17: "... dispuesto entre los que guardaban los montes que tenían cargo de cortar vigas y hacer tablas y otra madera de los montes . . ."

¹²⁷ This exploitation began immediately after the Guanajuato mines were opened in 1564, and extended into the post-colonial period. After the exhaustion of the local wood supply, Zacatecos began to draw on the northern Michoacán lumber reserves during the first part of the 17th century (González, 1886, vol. 1, p. 313).

313 ing is carried on outside the Sierra. Some beams and planks are cut by the people of Zipiajo and Teremendo, who have large tracts of forest on the slopes of El Zirate, and some farmers of the Lake area and La Cañada cut small amounts of lumber for home use.

313 Beals' discussion (1946, pp. 15-19) of legal
423 cutting rights, lumber products, and lumber
tools for Cherán can be applied to most of the present Sierra pueblos; therefore, only a summary will be given here. As mentioned above, all Sierra pueblos possess varying amounts of forest land held as common property. Since the late 1930's the Federal Government has attempted [656] to control exploitation by placing all large forest areas under national domain, by encouraging the organization of local lumbering cooperatives, and by periodically inspecting lumbering activities. [657] In most pueblos the Federal tax on lumber products is passed on to the individual woodsmen, who pay the town council a given amount for cutting rights. In other towns lumber cooperatives have been formed to pay the tax, each member contributing dues and having sole cutting rights in the village forest lands. [474]

Although much lumber is for local use (house construction, fences, aqueducts, watering troughs, shakes, etc.), most is cut for the outside market. [439] Raw logs, beams (*vigas*), planks (*vigetas*, *tablas*), and railroad ties of pine and fir are cut and prepared for lumber contractors, whose heavy trucks [493] visit the larger villages during the dry season to haul the products to the nearest railhead. Wood- [492] cutters of the remote pueblos drag beams and planks to market with the aid of burros and mules. [491] Los Reyes, Tingüindín, Tangamandapio, and Zamora handle the forest products from the western part of the Sierra, while Uruapan, Zacapu, Ajuno Station, and Pátzcuaro serve as lumber points for the eastern section. Formerly a significant forest industry, shake making (performed by skilled specialists) is slowly declining because of the increasing use of tile roofing.¹²⁸ Turpentine [314] is no longer distilled locally. (See Beals, 1946, p. 18, for illustration of Tarascan still.) Rather, the resin (*resina*) is gathered in 5-gallon tins and taken to the village, where they are periodically

¹²⁸ Although in some pueblos (Památzcuaro and ranches, Angahuan, Capetere) shakes are still made for export to Uruapan, most are used locally. During colonial times and even in the last century large quantities of shakes were shipped from the Sierra to the northern mines, where they were the principal roofing material.

314 picked up by trucks from turpentine distilleries in Uruapan and Morelia. Charcoal is a minor commercial forest product made by Tarascans living near mestizo towns. The latter comprise [312] the principal markets for charcoal, which has never entered Tarascan culture.¹²⁰ Other minor forest products consist of *ocote* splinters, used for primitive interior illumination;¹²¹ softwoods (madroño, jaboncillo, aile, etc.) for lathe work; pine and fir for cabinet work; etc.

313 Within the last 50 years the commercial sawmill has penetrated into the Sierra. Lumber companies purchase cutting rights of standing timber from the pueblos and set up a steam- or (when near a power line) electric-powered saw in the midst of the forest.¹²¹ When the suitable timber has been depleted (under Federal inspection), the mill closes down, and the remnant of the forest reverts to the pueblo. Although most [464] companies bring in mestizo labor, many Tarascans from villages nearby obtain seasonal work in the sawmills, thereby supplementing their usually low income. Because of their ephemeral character, the number of mills in the area varies. In 1940 there were five mills in the Sierra proper; in 1946 the number had decreased to three.

During the last 100 years cutting has exceeded natural timber growth in the Sierra. Clearing of new plowland to sustain increased population and commercial lumbering have been the major factors of forest depletion. Moreover, disease has recently destroyed acres of pine in the vicinity of Tarecuto, and volcanic ash has laid waste the forest within a 3-mile radius of Parícutin. Lumbering even by the Tarascan woodsmen is often wasteful. Large trees are sometimes cut and left unattended for years until rot renders the wood useless.¹²² Improper tapping for resin and testing for shakes often kill many trees. The sawmills, operating on a much larger scale than the native lumbermen, are even more destructive, and in former years they depleted large sections of Sierra forest. Approximately 50 years ago the timberland in the eastern part of the Sierra east

¹²⁰ The main charcoal-producing towns in the area are San Lorenzo (Uruapan market), Opopeo and Cuanajo (Pátzcuaro market).

¹²¹ The *vencheros* around Pamatácuaro gather much *ocote*, which the women market in the large mestizo towns bordering the Sierra.

¹²² In 1944 the pueblo of San Felipe sold its forest to an Uruapan company for two million pesos. The proceeds were deposited in an Uruapan bank, where they remain communal property.

¹²³ Such wasteful exploitation was much in evidence in the forest lands of Pamatácuaro on the southern slope of Cerro de Patamban.

- 313 of Nahuatzen, Sevina, and Cumachuén was almost completely stripped by the mills. Today in this area, barren, windswept sheep pastures, supporting occasional remnant clumps of pine, indicate the extent of forest destruction (pl. 8). Throughout the Sierra there is probably not a piece of virgin timber, so long and thorough has been lumber exploitation.

HANDICRAFTS

438 Among most people lacking modern transportation facilities and mass production techniques, 472 cottage industries, often termed "native crafts," 463 are characteristic of the local economy. Owing to the presence of particular raw materials nearby and/or to traditional skills, people of one village often tend to specialize in one or more crafts. Cottage industry and village specialization are prevalent in most of indigenous and even mestizo Mexico. It is and has been particularly so among the Tarascans, whom the early Spanish chroniclers described as a skilled and clever people (Beaumont, 1874, vol. 2, p. 165). Moreover, progressive exhaustion of originally poor soils and population increase have forced many farmers of the Sierra to turn to crafts for additional income. Today five general handicrafts (ceramics, textiles, woodwork, leathercraft, and metalwork) are practiced and over 30 types of articles made among 54 Tarascan towns and *ranchos* (map 20). Only 10 Tarascan-speaking pueblos lack a cottage industry. In 26 pueblos at least 25 percent of the "working" population¹³ practice various crafts. Some villages specialize in only one industry. For example, over 80 percent of the working population of Santa Fé de la Laguna make pottery; nine-tenths of that of Jarácuaro are hat makers. Moreover, many towns which carry on various handicrafts may concentrate on one. Thus, Tarecuaro is famed for agave fiber products, Pamatácuaro and neighboring *ranchos* for wooden spoons and bowls. In most pueblos more than one craft is practiced, and in a few as many as eight distinct products are made.

177 Like so many of his material culture elements, 463 the Tarascan's crafts represent a mixture of

¹³ The "working" population in Tarascan towns is estimated by dividing the total population by 2.5. The Tarascan family averages about 4 persons, but often the wife devotes her spare time to cottage industry and is sometimes helped by the older children. Boys over 12 years old usually work in the fields as farmers or in the house at the father's trade.

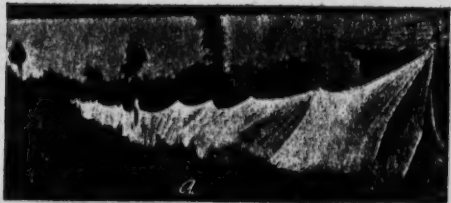
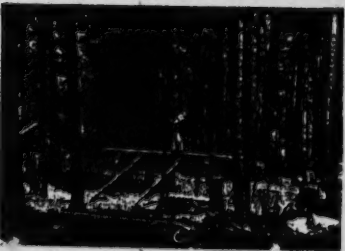
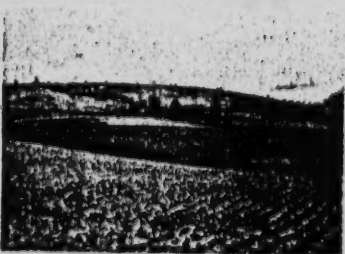
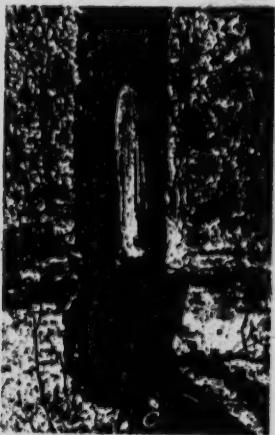
[314]

[33]

[50]

[221]

[313]



[Ent-plate 8]

PLATE 8.—Fishing and forest exploitation. a. Chishorro nets drying on La Fomada Island, Lake Titicaca. b. The small Hamza dugout, Lake Krahin. Note paddles attached to rear of canoe. c. Typical method of gathering resin (near Chirapac). The resin flows into the clay vase attached to the tree. d. The small Churakua, or gill net, drying (Jumbala). e. Drying racks in mixed pine-elm forest, southern slope of Cerro de Tolambon, near Fomadenaro. f. Burning charcoal near Capacuaru. g. Out-over land between Ayina and Tairaco, now in maize fields and pasture.